

Scientific Note

Notes on the Use of Spadices of *Washington filifera* (Wendl) by *Xylocopa californica* (Cresson) (Hymenoptera: Apoidea)¹

The Southern California carpenter bee, *Xylocopa californica* Cresson, is known to nest in the trunks of the desert fan palm, *Washingtonia filifera* Wendl (Hurd, 1978, an annot. cat. of the carpenter bees of the West. Hem., Smith. Inst. Press, Washington, D.C.). Although the species has not been observed to construct its own entrance tunnels into the trunks, females are known to enter the exit holes of the giant palm boring beetle, *Dinapate wrightii* (Horn). They have been observed remaining in the holes for at least one-half hour and no doubt the females enlarge these holes for nesting.

Recently, Ron Grunt of Twentynine Palms, California, brought me several shed spadices of *W. filifera*. He had picked them up off the ground in the western (and privately owned) portion of the Oasis of Mara, San Bernardino County, California. Typically, the spadices of this species of palm are approximately 3.5 m long, develop between two and five hundred thousand 6 mm-diameter-flowers and are from 4 to 10 cm wide at their proximal end. These usually break off within two years after fruit production. A loud buzzing from within the spadices caused Grunt to inspect them at which time he discovered dime-sized holes in the proximal ends of approximately 20% of them. Within minutes after he picked them up numerous specimens of *X. californica* flew from the holes.

He brought me ten spadices for examination on March 12, 1984. All of them had tunnels starting from where the spadices had broken off from the tree and running from 7 to 38 cm toward the tip. One stalk had three tunnels. The entrance holes had a mean diameter of 15 mm. Each contained from five to twelve mature carpenter bees identified as *X. californica*.

Two stalks were cut lengthwise revealing 12 and 13 discolored ridges that appeared to indicate larval chambers. Grunt believed the bees hibernated in these tunnels for adults were found in spadices during winter and were observed leaving them in the spring.

The grove at the east end of the Oasis of Mara is dense, significantly disturbed and sits around and in a small motel complex. The trees receive fault-associated groundwater that nearly reaches the surface and irrigation from domestic watering. The spadices had been on the ground for approximately two years and, in general, were wider at their base than spadices produced by trees in undisturbed settings.

I checked spadices from nine other undisturbed palm groves in the Colorado Desert of southeastern California and could not find additional *Xylocopa* tunnels except at Mortero palms in Anza-Borrego Desert State Park in San Diego County, California. This grove was similar to the western portion of the Oasis of Mara in that the trees were so dense that the center of the oasis received little or no sunlight. Approximately 10% of the spadices had been burrowed into by carpenter bees in

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the same manner as at Mara. I cut two of these lengthwise revealing five adult and two larvae in the first and two adult and six larvae in the second.

Carpenter bees are common in some palm groves. They are seen entering palm boring beetle exit holes and also at the flowers in June and July. Often, the bees destroy the ovaries as they feed on the nectar. To my knowledge, the utilization of fallen palm spadices for nesting chambers, and perhaps as hibernaculums, has not been previously noted. That they utilize them in this manner is not surprising—most desert plants do not have trunks or branches of sufficient girth to meet the nesting requirements of *Xylocopa*. Why then are the spadices not used in every palm oasis? I suspect the rarity of this technique may be due to the fact that the vast majority of the dead flower stalks either fall into direct sunlight, making them thermally unsuitable, or into the paths of floodwaters. All of the spadices which were, or had been, occupied by *Xylocopa* were in constant or at least abundant shade and not subject to being washed away by floods as so often occurs in canyon oases. Only dense stands of *W. filifera* not subject to floods are likely to provide the necessary conditions.

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